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Method for Testing External Influences on Biological Tissue

The invention relates to a method for testing external influences on biological tissue, including that of human beings, by using local and non-local reactions of biophoton emission (ultraweak photon emissions from biological systems).

Known from EP-A-0430150 is that slight differences in the reaction of biological systems to some kind of influences can be quickly, reliably and non-invasively detected by means of biophoton emissions or delayed luminescence. These methods are based on measuring the intensity of weak light emissions from biological systems ("biophotons") without and after external excitation, and utilize the differences in intensity or differences in characteristic decay functions of the delayed luminescence to draw conclusions as to the effect or effectiveness of the influencing variables.

By contrast, the object of the invention is to find a method for testing the effect or effectiveness of external influences on biological tissue, e.g., including that of human beings, which makes it possible to ascertain differences in the influencing variables and in their effect that are smaller than could previously be found non-invasively.

This object is achieved with the features of the patent claim.

The invention is based on measuring the ultraweak photoemissions not just at the treated location of the respective object, but also on other, different points of the tissue that were not directly exposed to the external influence. Specifically, it was surprisingly discovered that many, if not most, external influences also trigger changes in photoemission on parts of the tissue that were not directly treated. Comparing the "responses" on tissue sections that were not directly treated to "responses" on treated tissue sections as reflected in the

changes in the respective intensities of the ultraweak photoemissions yields important indices for the effect or effectiveness of the examined influence ("stimulus"). It may here be advantageous to also use filter systems or polarizers.

The invention will be described in greater detail below in an exemplary embodiment.

The right arm of a test subject suffering from a skin disease is irradiated with a UV lamp (hanseatic type, Schott type 816 Ee, 230 V, 105 W, UV type 3) for 5 minutes. The irradiated surface consists of partially diseased, partially healthy tissue. The left arm is symmetrically affected in the same way. Table 1 shows the measured values for spontaneous photoemission (PE, in counts/s) and initial values for delayed luminescence after 10 s of exposure to a 150 W tungsten lamp (NB, in counts/s) before, immediately after and 1 hour after treatment.

Treated arm	Diseased region		Relatively healthy region	
	PE	NB	PE	NB
Before treatment	11.0	1,030	9.9	1,105
After treatment	44.4	670	39.5	975
1 hour later	13.6	920	13.6	1,695

Untreated arm	Diseased region		Relatively healthy region	
	PE	NB	PE	NB
Before treatment	11.2	920	9.7	995
After treatment	12.2	1,000	14.5	1,160
1 hour later	11.0	1,060	9.7	1,450

The example shows that responses of significance for understanding the treatment process and its influences on the tissue arise not just at the treated location, but also at the untreated locations. These reactions can also be of importance for testing external influences. There are no other methods for this purpose.